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States of Play: Evaluating the Renaissance in US Military Wargaming

Critical Military Studies

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Abstract

This paper introduces the topic of military wargaming into current critical debates in International Relations (IR) on games and gaming, which to date have focused on civilian, recreational forms. Identifying a renaissance which began in the US in 2014, the core argument developed is that wargaming utilises key elements of critical/postpositivist theory in its interventions into the 'human training dimension' with the aim of impacting upon the inner domain of players in promotion of military ends. Drawing on Eyal Weizman's work, the paper makes two key claims: 1) Wargaming poses a profound methodological and epistemological challenge to the quantitatively-oriented Operations Research (OR) community which has dominated DoD analysis for nearly a century. 2) By decoupling critical/postpositivist traditions from their intended ends, using them instead to impact upon players, wargaming militarises them. The paper begins by locating the origins of the wargaming renaissance in the Defense Innovation Initiative and associated Third Offset Strategy. It then shows how US military gaming intervenes at the level of the human training dimension by cultivating specific forms of critical thinking, multiple futures planning, and reflexive decision-making using distinctively critical/postpositivist insights. From there it sets out three key challenges posed by wargaming to OR which trouble the latter's claims to prediction, objectivity, and rationalism, before concluding that a new form of 'post-quantitative defence analysis' is emergent which militarises the tools of critical/postpositivist approaches.

Key words: Wargames; games; US military; decision-making; critical theory/methods; human training dimension

Introduction

Since 2014, a renaissance in US military wargaming has been underway. Often confused or conflated with modelling and simulation, wargaming is distinctive in its focus on human behaviour and decision-making. In leading professional wargamer Dr Peter Perla's words, in a wargame 'the flow of events is affected by and in turn affects decisions made during the course of those events by players representing the opposing sides... Wargaming is an experiment in human interaction' (1990, 274). This article demonstrates that US military wargaming utilises key elements of critical/postpositivist theory in its

interventions into the ‘human training dimension’¹ by cultivating specific forms of critical thinking, multiple futures planning, and reflexive decision-making. The ultimate aim of this repurposing, the paper argues, is to intervene in the inner world of players in promotion of military ends. As Eyal Weizman explains in his study of the Israeli Defence Force’s (IDF) use of critical theory, military analysts ‘exult at the possibilities offered by Deleuze and Guattari, Tschumi, and so on, because this inner domain – the subversive micro-sovereignty of privacy – now represents a potential extension of their power and sovereignty into places into which it was not previously extended. As such the invasion of the “home” – of intimate space, the space of subjectivity – has become yet another “last frontier”’ (2006, 20).

This intervention into the ‘last frontier’ of the human dimension entails, the paper shows, a profound methodological and epistemological challenge to the quantitatively-oriented Operations Research (OR) community which has dominated DoD analysis for nearly a century. Mirroring challenges posed to positivist approaches by critical/postpositivist scholars across the social sciences, the article shows that the wargaming renaissance has levelled three key critiques of OR: its claims of predictive capacities; its attempt to provide objective results; and its reductionist rationalism. The paper argues that these challenges reflect, and indeed draw directly upon, critical/postpositivist analysis but retain their conventional military and statecentric purposes. By decoupling critical/postpositivist approaches from their intended counter- or anti-hegemonic ends, using them instead to intervene in the inner realm of players, the paper argues that wargaming militarises² them. It thus responds to Weizman’s claim that it is important to ‘explore what is at stake in the uses of such theoretical “tools” by military thinkers, especially since they are the very same tools through which forms of oppositional critique have themselves frequently been articulated’ (2006, 8).

The paper begins by locating the wargaming renaissance’s origins in the 2014 ‘Defence Innovation Initiative’ (DII) and associated ‘Third Offset Strategy’ (3OS). It then sets out the ways in which wargaming intervenes in the human training dimension, specifically through its focus on critical thinking, multiple futures planning, and reflexive decision-making. From there, it demonstrates that the

¹ The ‘human dimension’ here refers to individuals within the US military. Human dimension gaming impacts upon those who are taught or trained, as opposed to an external target population. This is not to be confused with the ‘human domain’, which relates to individuals and groups outside the US military, such as the local population in a conflict zone, which may alternatively, or also, be the target of military wargaming.

² Important work has been done recently analysing and contesting the notion of militarisation, in particular by Alison Howell (2018). While Howell’s points surrounding the limits of militarisation in the context of the racial and ableist martial politics of the police and university are well taken, I use the term ‘militarised’ here not to suggest that critical/postpositivist traditions were ever free of militarisms but rather in the more literal sense of their deployment by military actors.

wargaming resurgence entails a challenge to the quantitative Operations Research (OR) methods conventionally used within DoD – specifically the latter’s claims to prediction, objectivity, and rationalism – by integrating critical/postpositivist methods into defense analysis. I call this new approach ‘post-quantitative defence analysis’ because it inherits the *means*, but not the *ends*, of critical/postpositivist methods. The paper concludes that wargaming’s mobilisation of these critical/postpositivist tools in the service of impacting upon the inner realm of players reflects their militarisation.

The Global Politics of Gaming

Over the last decade, games and gaming have become the focus of scholarly attention across the social sciences and humanities. Commercial videogames are currently the most widely researched genre. A small but growing community of scholars in IR have explored the politics, militarism, exceptionalism, and violence of contemporary videogame content and culture, as well as the affirmatory and emancipatory potentials of this medium (Salter 2011; Robinson 2012, 2015, 2016; Ciută 2016; Hayden 2016; Brown 2017; Berents and Keogh 2018; Jarvis and Robinson 2019). In parallel, the use of games and simulations as pedagogical tools has been the focus of important debates in the discipline (Asal 2005; Asal and Kratoville 2013; Horn, Rubin and Schouenborg 2015; de Zamaróczy 2016; Lee and Shirkey 2017; Orsini 2018). Interesting explorations of revolutionary history and potential of gaming have been generated by scholars working on the Class Wargames project (Barbrook 2014), and important studies have engaged with racialised and colonial dimensions of gaming (Dyer-Witthford and De Peuter 2009; Mukherjee 2017; Lammes and de Smale 2018) and the gendered aspects of games and gaming culture (Condis 2018). In addition, engagements from a range of disciplines have provided insightful philosophical explorations of games and gaming (Galloway 2006; Wark 2007).

While the militarism of civilian gaming, notably first-person shooters and games set in real or fictional conflicts, has been explored in some detail the literature, the military applications of gaming remain under-researched. The US military is increasingly using wargames across a wide range of strategic, operational, and tactical activities, including future planning, scenario rehearsal, and weapons, vehicle, language, and ‘cultural sensitivity’ training. The various services use both digital and analogue games, that is, games that are computer-based and games that use boards, counters, and other material artefacts. Military wargames are often categorised as analytical (for example to develop strategy) or

educational (including both teaching and training). Off-the-shelf and bespoke games are used in both analytical and educational spheres; the military produces and sponsors original its own games, modifies existing commercial games, and uses commercial games in their original form. Despite this ubiquity, little attention has been paid to military wargaming in critical IR debates, with the notable exceptions of work by James der Derian (1990; 2003; 2008) and Antoine Bousquet (in Mackay 2015).

In policy-facing fora, recent articles have made the case for wargaming as a *method* of inquiry from a practitioner perspective, in particular in the context of nuclear strategy (Pauly 2018; Reddie *et al.* 2018), and it has featured increasingly in defence publications such *War on the Rocks* (Jones 2016; Lacey 2016, 2019; Pettyjohn and Shlapak 2016; Bartels 2017, 2018; Bae 2018; Jensen, Cuomo and Whyte 2018; Schuety and Will 2018; Lin-Greenberg 2019) and the *Bulletin of the Atomic Scientists* (Barzashka 2019a, 2019b). What is currently lacking in the literature, however, is a critical analysis of wargaming as an *object* of inquiry. While the above literature has made the case for the utility of wargaming as a method of research or teaching, little research has been done on the character and impacts of the wargaming renaissance by treating it as an object of analysis.

This article fills this gap in the literature by developing the first critical analysis in IR of the ways in which wargaming draws on critical/postpositivist insights to impact upon on players via the human training dimension and the implications of its challenge to quantitative defence analysis. To do this, it draws upon key military reports and manuals, DoD memoranda, a series of fieldwork trips to US military wargames and schoolhouses and associated interviews with wargaming practitioners undertaken between 2017 and 2019 by the author, scholarly work from Defence Studies and associated fields, and the reports and publications of the wargaming community of practice (CoP)³ within DoD to develop a novel account of an emergent ‘post-quantitative’ mode of defence analysis which militarises critical/postpositivist methods by putting them to work in the service of conventional state/military ends.

³ The wargaming CoP referred to in this article encompasses a variety of practitioners in and around DoD. In the later sections, I refer to the prevailing opinions of the CoP in contradistinction to the Operations Research (OR) community. The opinions I describe do not, of course, reflect those of all DoD wargamers; in particular a new generation of defence wargamers is far more convinced by the use of quantitative methods than is the established CoP. I nevertheless use this shorthand to elucidate these general trends.

The Wargaming Renaissance

The origins of the recent wargaming renaissance can be traced to the 2014 Defence Innovation Initiative (DII). Its mission, then-Defense Secretary Chuck Hagel stated in a widely-circulated memorandum, was to ‘pursue innovative ways to sustain and advance our military superiority for the 21st Century and improve business operations throughout the [Defense] Department’ (Hagel 2014a, 1). Speaking at the Reagan National Defense Forum in Simi, California, he elaborated:

The Department of Defense is undergoing a defining time of transition. After 13 years of war fought by an all-volunteer force, we’re facing a reshaping of our enterprise by a fiscal environment plagued by constant budget uncertainty and a large, continuing decline in resources, and by a historic realignment of interests and influences around the world... DoD’s responsibilities are to be prepared to address a broad range of contingencies and unpredictable crises well into the future. That means we must prepare our defense enterprise for the challenges of that uncertain future (Hagel 2014b).

As this suggests, the DII was expansive in scope, aiming to overhaul key elements of DOD culture and promote fresh thinking in spheres as diverse as concepts of operations, research and development, capabilities, leader development, and business practices (White *et al.* 2017, xi). A focus on advanced technology was also central; the DII’s Third Offset Strategy (3OS) was created to promote the repurposing and creation of new, ‘game-changing’ (Hagel 2014b), technologies.

Based the classical economic principle of comparative advantage, the 3OS sought to establish how the US could tip the balance in its favour through the creative use of technology by maximising strengths and efficiencies while undermining - offsetting - those of an opponent (Norwood and Jensen 2016, 35). The core aim of the 3OS was to counter these dual problems of a closing technology gap and fiscal austerity through a ‘capabilities race’ (White *et al.* 2017) which would offset the weaknesses evidenced in the US’s interventions in Iraq and Afghanistan. As its key advocate, then Deputy Defense Secretary Bob Work, summarised: ‘while the United States and our closest allies fought two lengthy wars over the past 13 years, the rest of the world and our potential adversaries were seeing how we operated. They looked at our advantages. They studied them. They analyzed them. They looked for weaknesses. And then they set about devising ways to counter our technological over-match. (Work 2015a). In response to this, as Luis Simón has argued, the 3OS would ‘articulate a conceptual and discursive framework that integrates existing initiatives and channels the financial and intellectual resources of America’s strategic and technological epistemic communities around a coherent vision’ (2016, 422). This would be done across a number of key areas, including anti-access and area denial; guided munitions; undersea warfare; cyber and electronic warfare; human-machine teaming; and

wargaming and concepts development (White *et al.* 2017, xi). As this suggests, wargaming was identified as a key element of the new strategic posture.

Its architects also made clear, however, that technology alone would not resolve the decline in US advantage. Simón explains: ‘what matters is not so much technology itself, but rather its ability to generate concrete operational and strategic effects. New strategic and operational challenges call for innovative concepts of operations, which in turn require new capabilities as well as doctrinal and organisational reforms within the armed forces’ (2016, 418). Lovelace similarly emphasizes the limitations of technology: ‘the acquisition of technology alone will not achieve the Third Offset Strategy. It must include enabling operational and organizational concepts that enable US forces to realize the offset advantage’ (Lovelace 2016, 6). What was required in addition to technology were new ways of thinking and operating, and a fresh approach decision-making. As the following section explores, the architects of the 3OS identified wargaming a key element of this endeavour.

In a widely circulated memorandum of 9th February 2015, Work set out the place of wargaming in the 3OS and broader DII. It began:

I am concerned that the [Defense] Department’s ability to test concepts, capabilities, and plans using simulations and other techniques – otherwise known as wargaming – has atrophied. To most effectively pursue an innovative third offset strategy, avoid operational and technological surprise, and make the best use of our limited resources, we need to reinvigorate, institutionalize, and systematize wargaming across the Department. Reinvigorated wargaming across the defense enterprise fits with the Defense Innovation Initiative, which aims to bolster the credibility of US security guarantees at home and abroad through innovative and agile thinking and actions (Work 2015b, 1).

Here and in a number of articles, speeches, and interviews in 2015, Work expanded upon Hagel’s statement the previous year that a ‘reinvigorated wargaming effort will develop and test alternative ways of achieving our strategic objectives and help us think more clearly about the future security environment’ (Hagel 2014a). \$500 million was allocated for expanding wargaming and operational concept tests and demonstrations from the FYDP budget (Mehta 2016).

Wargaming’s role as a source of doctrinal innovation, Work argued, should be restored in the new security environment (Work 2015b, 2). Specifically, as one article suggested, the DoD ‘should pursue a joint wargaming initiative designed to generate new concepts around the proposed offset technologies. Wargames serve as a time-tested mechanism for generating new ideas about warfare’ (Norwood and Jensen 2016, 35). In keeping with the 3OS’s agenda of innovation, the role of wargames was to devise and experiment with novel applications for emergent technologies and the US’s broader

operational approaches. In a security environment characterised by widespread ambiguity and complexity, wargaming was to facilitate conceptual innovation. In a co-authored article with Paul Selva, then Vice Chairman of the Joint Chiefs of Staff, Work laid out the key applications of DoD wargaming:

Wargames provide opportunities to test new ideas and explore the art of the possible. They help us imagine alternative ways of operating and envision new capabilities that might make a difference on future battlefields. When creatively and rigorously applied, wargames help us to think through and begin to resolve complex military challenges, foster the testing of new strategic and operational concepts, stimulate debate, and inform investments in new capabilities. Wargames help strip down a strategic, operational, or tactical problem and reduce its complexity in order to identify the few, important factors that constrain us or an opponent. They provide structured, measured, rigorous — but intellectually liberating — environments to help us explore what works (winning) and what doesn't (losing) across all dimensions of warfighting. They permit hypotheses to be challenged and theories to be tested during either adjudicated moves or free play settings, thereby allowing current and future leaders to expand the boundaries of warfare theory. And they provide players with the opportunity to make critical mistakes and learn from them — and to perhaps reveal breakthrough strategies and tactics when doing so (Work and Selva 2015).

With this restored faith in the innovative capacities of wargaming, its resurgence began.

In his February memo, Work set out his vision for three time horizons for the new DoD-wide wargaming initiative. Led by the Combatant Commands and Services, near-term wargaming (0-5 years into the future) would focus on the execution and improvement of current operations plans, using workshops, red-teaming, table-top exercises, and modelling and simulation for planning, experiments and proto-type development. Mid-term wargaming (5-15 years), led by the Joint Staff, was dedicated to the development of new capabilities and operational/organisational concepts by incorporating innovative approaches and technologies into force planning. Using workshops, seminar-style wargames, exercises and modelling and simulation, future scenarios would be gamed to explore future US and adversary orders of battle and promote operational innovation. Long-term gaming (beyond 15 years) was to assess the operational impacts of technology, explore future challenges, and craft long-term competitive strategies. The Office of Net Assessment would oversee this future-focused initiative (Work 2015b, 1-2).

Perla argues that professional wargaming fluctuates in a 'sine wave of popularity' in which it experiences a 'roller-coaster ride of favour and disfavour among the [defense] department's leadership' (in Pournelle ed. 2017, 87). Having been periodically embraced and rejected through the twentieth century, since the launch of the 3OS and DII in 2014 wargaming has been enjoying renewed interest (Appelget *et al.* 2016, 18; Curry in Harrigan and Kirschenbaum 2016, 33; Norwood and Jensen 2016, 35-

6). Speaking at the first of three Military Operations Research Society (MORS) Special Meetings on Wargaming, Work called upon the wargaming CoP, a small but committed group of pioneers and practitioners who have weathered this storm of fluctuating favour, to capitalise on the opportunity afforded by the 3OS and demonstrate value of the wargaming process for the DoD and the nation (Pournelle ed. 2017, 7). The experience of this CoP could be used to 'revolutionize' DoD's approach to gaming (Davis in Pournelle ed. 2017, 16) and avoid a return to disfavour resulting from incorrect uses of wargaming by those bandwagoning on its resurgence (Perla in Pournelle ed. 2017, 87-8). The core task of the CoP was to demonstrate that wargaming is a 'key cylinder of the Department of Defense's innovative engine' (Gorak 2016, 4) and integrate it in to the larger analytic processes (Pournelle ed. 2017, 5).

To that end, a series of organisations and working groups were established. The Defense Wargaming Alignment Group (DWAG) was set up to drive innovation. Dubbed a 'group of the willing' (Pournelle and Deaton eds. 2018, 14), the DWAG meets fortnightly. Its members include representatives from COCOMs, Services, NGB, JS-J7, JS-J4, OSD-AT&L, OSD-CAPE, OSD-Policy, Office of Net Assessment, and Under Secretary of Defense for Intelligence (Gorak 2016, 6), and it produces a monthly report on wargaming activities and development in and around DoD. It is furnished with a \$10 million incentive fund to support wargaming activities; by 2017 it had funded fifty-eight games (Gorak 2016, 6; Pournelle and Deaton eds. 2018, 14). In addition a wargaming repository was established in the Cost Assessment and Program Evaluation (CAPE) group housed in the Office of the Secretary of Defense (OSD) was established to oversee and catalogue the proliferation of wargaming activities. The repository is 'a centralized hub for sharing of information as well as identifying number of wargames conducted (including upcoming games), capabilities, capacity, cost, and insights gained'. It is updated monthly and by 2016 it had accumulated over 550 wargames, 260 organizations and 212 support tools (Gorak 2016, 5).

At the same time, handbooks and doctrinal documents focusing on wargaming were emergent. In 2015 the Army War College published a 'Strategic Wargaming Series Handbook' detailing its activities and best practice guidance, and the 'Applied Critical Thinking Handbook' was released by TRADOC in association with the University of Foreign Military and Cultural Studies (on which more below). In 2017 Joint Publication 5.0, *Joint Planning*, situated course of action wargaming as the fourth of seven steps of its Joint Planning Process (JPP). As this suggests, wargaming activities have become more widespread and more visible in recent years in military schoolhouses and research institutions, including the Naval

Postgraduate School (Appelget *et al.* 2016), the Marine Corps University (Norwood and Jensen 2016, 36), the Air Force Research Laboratory (Bestard 2016), and The Centre for Army Analysis (Pournelle ed. 2017, 21). In parallel, civilian research centres have increased their wargaming activities, often sponsored by DoD, such as the RAND Corporation's Centre for Wargaming. As the following section elucidates, wargaming's key selling point was its capacity to intervene in the human training dimension as a means to map and mitigate the uncertainty and complexity of the 21st century security environment.

Gaming the Human Dimension

Uncertainty and Complexity

In 2014, Hagel noted that 'uncertainty is the only certainty in an interconnected world of seven billion people' (2014b). Many in the wargaming CoP have similarly emphasised the 'yawning unpredictability' (Sabin 2014, 55) and the 'complexity and structural uncertainty' (Harrigan and Kirschenbaum 2016) that the military currently faces. Indeed, as Christiansson notes, the rationalist basis of conventional strategic and doctrinal assumptions has been upset in the "runaway world" of reflexive modernity (citing Giddens 1990). Not only is society becoming increasingly complex, he continues, but 'the speed of increased complexity [is] increas[ing]' (Christiansson 2018, 274). The result, as one report puts it, is a strategic environment which is volatile, uncertain, complex, and ambiguous (VUCA). Increased interconnectedness, it continues, will cause news and events to propagate faster and the resultant excess of information will likely compromise decision-making and predication capabilities (White *et al.* 2017, 3).

Wargames, it is argued, can be used to mitigate this complexity and uncertainty. Work explains:

Military-relevant systems and technologies are changing quickly and new tactical and operational challenges are intensifying and proliferating, all during a period of fiscal pressure. During similar periods of technological and geostrategic flux, wargaming proved to be a useful tool both for improving our understanding of complex, uncertain environments and the changing character of warfare. When done right, wargames spur innovation and provide a mechanism for addressing emerging challenges, exploiting new technologies, and shaping the future security environment. They can potentially make the difference between wise and unwise investment trajectories and make our forces more successful in future conflicts (2015b, 1).

Faced with an incomprehensibly complicated global security environment, wargames, it is argued, allow practitioners to manage the complexity and chaos of lived experience by transposing them into ludic systems and procedures so as to experiment with possible courses of action (Harrigan and Kirschenbaum eds. 2016, xvii). Differently put, at its best wargaming reflects the ‘almost infinite complexities of warfare within a model that is simple enough to be played’ (Sabin 2014, 68). Wargaming has the capacity, its proponents argue, to ‘apprehend’ complexities (Train and Ruhnke, in Harrigan and Kirschenbaum eds. 2016, 528). Importantly, in contrast to conventional analytical methods which deal with complexity by reducing it to its constitutive elements (on which more below), wargaming explores complexity in all its complexity. It does this by constructing models into which the player can climb in order to explore and experiment to see what the effects of various courses might be (Train and Ruhnke, in Harrigan and Kirschenbaum eds. 2016, 526). Thus, the CoP argued, the novel contribution wargaming could make in an era of seemingly limitless complexity is to build ludic environments in which analysts could play through as many possible scenarios as desired. As Hanley puts it, ‘gaming historically has been useful in exposing infeasible, inadequate, unacceptable, or incomplete courses of action when faced with an intelligent adversary; in exposing factors that will govern successful strategies; in enriching an appreciation of logical adversary courses of action; and in exposing knowledge required for better planning and analysis’ (in Pournelle and Deaton eds. 2018, 59).

As this process of ‘climbing inside’ complex systems suggests, the key intervention made by wargaming is in the ‘human dimension’. This is because, as one report claims, wargames ‘provide a unique space for exploring the human element in complex scenarios’ (Pournelle and Deaton eds. 2018, 13). Unlike quantitative methods such as OR, which operate without a human ‘in-the-loop’, wargaming addresses the messy business of human thinking and decision-making. This is vital, as Levis and Elder note, because ‘[c]urrent military operations need, and future operations will demand, the capability to understand the human terrain and the various dimensions of human behavior within it’ (in Harrigan and Kirschenbaum eds. 2016, 475). During and since the invasions and occupations of the post-9/11 period, military strategists and planners have been increasingly focused on non-kinetic areas such as the political, economic, cultural, and human domains as key elements of operational success. These conflicts made it clear that ‘[a]ctions taken by all agents, together with beliefs, perceptions, intentions, and actions of all the people involved in an area of operations interact to affect the outcome...’ (Levis and Elder in Harrigan and Kirschenbaum eds. 2016, 475).

No less than the contemporary security environment, the human element is 'infinitely complex'. As one doctrinal document explains, this is because it 'pushes back, evolves, and changes rapidly and unpredictably. We currently lack sufficient analytical power to reliably understand functions in the human domain in the same way we can in the biological or engineering domains' (TRADOC 2015, 35). The promise of wargames in this context is, then, to teach personnel to cope with and manage this unruly human domain/dimension to (re)gain an advantage. As Perla explains, wargaming enables decision-makers to 'learn about how to deal with an uncertain and unpredictable future; to learn about how to understand its complexities; and to learn about how to make good decisions today and tomorrow in spite of those complexities, uncertainties, and unpredictability' (in Harrigan and Kirschenbaum eds. 2016, 159). Some wargame advocates have described this learning process as developing a 'capacity for intuition' or a 'feel' for how to respond in a particular situation (Losh in Harrigan and Kirschenbaum 2016, 359). As the remainder of this section explains, proponents argue that the unique contribution of wargaming is its capacity to utilise critical thinking, multiple futures planning, and reflexive decision-making to manage the complexities of the contemporary security environment to (re)gain the advantage.

Critical Thinking

Since the launch of the 3OS and DII, the concept of critical thinking has become increasingly visible across the DoD. Work drew attention to this issue, emphasising the need for 'innovative and agile thinking' (Work 2015b, 1), while TRADOC developed 'The Applied Critical Thinking Handbook', produced on the basis of a program taught at the University of Foreign and Cultural Studies (UFMCS). Focusing on 'red-teaming', a sub-species of wargaming, the Handbook states as its goal the development of a 'disposition of curiosity' and 'self-awareness' in the service of avoiding the predictable failures that people and organisations unwittingly court as a result of their 'mindsets, biases and experiences, which are formed in large part by their own culture and context' (TRADOC 2015, 1). It recommends learning to think 'meta-cognitively' and promises to teach graduates how humans think and how culture shapes thought in order to 'facilitate strategic and operational decision making which is informed by cultural empathy' (TRADOC 2015, 6). In so doing, students will break away from 'cognitive auto-pilot' and 'unreflective dependence upon our intuition' (TRADOC 2015, 48). Weizman's exploration of similar projects in the IDF reflects this push towards critical thinking: 'We attempt to teach and train soldiers to think ... We read Christopher Alexander, can you imagine? John Forester, other architects. We are

reading Gregory Bateson, we are reading Clifford Geertz... [O]ur soldiers, our generals are reflecting upon these kinds of material' (2006, 10).

By promoting critical thinking, it is claimed, wargames can bring biases and errors to light. Cultural wargames, for example, work 'by deliberately placing participants in the position of an unfamiliar culture, with rules and procedures and objectives that reflect that culture specifically[,] and then expos[ing] them to a scenario that places strain on their assumptions and challenges them to respond *culturally* to the crisis' (Wallman in Harrigan and Kirschenbaum 2016, 545). This, in turn, allows them to develop 'an enhanced enemy mindset' (Pournelle and Deaton eds. 2018, 9). In a context characterised by diversity and ambiguity, proponents argue that the critical thinking provided by wargaming can help 'safeguard against individual and organizational tendencies toward biases, errors in cognition, and groupthink... Our goal is to be better prepared and less surprised in dealing with complexity' (TRADOC 2015, 1). As will be discussed further below, such an approach deploys reflexive critical thinking in the service of military ends, decoupling it from its intended counter- or anti-hegemonic purposes.

Plural Futures

From the outset, Work noted that the 3OS had a focus on the future. His memo stipulated that wargaming across different time horizons would bring together 'teams of defense professionals to think critically about potential future challenges' (Work 2015b, 2). He elaborated elsewhere: the 3OS will have a 'temporal component... So, we'll be looking for promising technologies that we can do in what we call the FYDP, the future years defense program, generally about five years out. We'll identify long-range advances that we can pull up and hopefully field in the '20s, and then we'll plant the seeds for R&D, which will give us an advantage for the '30s' (Work 2015a). Wargames' capacity to model the future has long been a topic of debate in both the civilian and professional CoPs; perhaps the most well-known statement on the topic is Jim Dunnigan's claim that a wargame is a 'paper time machine' (cited in Sabin 2014, 3). Sabin explains that while civilian/hobby games have tended to focus on modelling and reconstructing past historical battles, the professional/military community is more interested in current and future conflicts in order to anticipate and prepare for challenges to come (Sabin 2014, 36). This interest has been central to the 3OS's revival of wargaming.

Many key figures in the wargaming community are adamant that wargaming cannot predict the future. Perla, for example, has stated that '[i]t is quite impossible, in the hobby world or the professional

world, to build a wargame or a combat model that is *certain* to reflect accurately the reality of future combat for the simple reason that we do not *know* what that reality will be' (1990, 241. Emphasis in original). Ewell similarly notes that '[g]ames are really good with showing possible outcomes and really bad at predicting outcomes" (cited in Pournelle and Deaton eds. 2018, 16), while Hanley observes that 'one play of a game can no more predict a specific outcome any more than one play of a baseball game can predict the score and player injuries of a following game' (in Pournelle and Deaton eds. 2018, 60). Games cannot be predictive, then, because they apprehend and model elements not of an 'objective' present or future reality but rather the designer's subjective perception of it. In Perla's words, '[t]he only realizable goal for a model of future warfare is to reflect, in the most complete and coherent way possible, the analysts' (or the analytical community's) beliefs and understanding of the key elements of that combat' (Perla 1990, 241). Treating these as predictive can, and has, led to significant errors in the past and contributed to wargaming's previous falls from grace in the DOD.

In spite of this, however, there remains an interest in the possibility of using wargames to anticipate events to come. Thomas Allen has described this as the 'quest for the simulation that will predict the future.' He explains: 'Military modellers know, as an article of faith, that the future cannot be predicted. And yet, without saying it aloud, many do want to discover some way to simulate the future,' an aim which is sometimes implicitly encouraged by superiors (Allen 1989, 96). Many designers and practitioners have begun to claim for gaming a specific type of predictive potential. Some point to the prophetic character of games played about 20th century conflicts. Hanley, for example, notes the 'predictive value' of gaming at the Naval War College which anticipated tactics and predicted the outcome of the Russo-Japanese war, and the successful operational gaming of Russia and Germany in World War I and II. These gaming activities, he explains, are 'legendary for anticipating the character of future campaigns, developing operational schemes, and promoting the development of technology and systems of conduct campaigns' (in Pournelle and Deaton eds. 2018, 61). Allen similarly describes the 'prophetic' character of US gaming during the Vietnam War in his comparison of game and real-world events (Allen 1989). These 'chilling glances into future realities' (Allen 1989, 5) are of significant appeal to the DOD in the 3OS era.

Wargaming, it is claimed, is useful for exploring why future conflicts might turn out in particular ways and for mapping these possible paths in more detail than could be accomplished simply by thinking about or discussing them. Wargaming's predictive capability lies not in determining which outcome or course of action will come to pass but rather in exploring a range of alternatives so as to

prepare for a series of possibilities. Members of the wargaming CoP emphasise that it is potential, possible, or probable futures that wargaming can illuminate, rather than definitive trajectories or outcomes. As Perla explains,

[b]y exercising, testing, and modifying [a] model, analysts and wargamers can explore the implications, not of some unknowable future reality, but of our current, restricted, and uncertain view of what that reality might be like. We can do no better than to try to identify the hidden interconnections and consistencies of our current thinking as objectively as possible. But such a goal, as limited as it may appear to those who seek crystal balls in computer code, is not only a worthy one but essential as well (Perla 1990, 241).

In other words, wargaming is useful in exploring multiple contingent possible realities rather than predicting a singular concrete future. It is this that explains its apparently prophetic legacy in 20th century conflicts. By exploring a range of possible futures, gaming has earned a place in the analysis community because they ‘are good for exploring situations that are too complicated to predict’ (Ewell in Pournelle and Deaton eds. 2018, 16). They can be used as a crystal ball to the extent that they offer ‘advance insights into how future engagements might develop given a certain set of initial conditions’, functioning like weather forecasts (Sabin 2014, 63). While concrete predictions tend to be wrong, gaming can show you ‘what your problems are going to be’ (Allen 1989, 154).

As this suggests, the more the DoD focuses on the future as a key terrain of the 3OS, the greater the role for wargaming. As Joint Publication 5.0 notes, ‘[a]nticipation is key to effective planning... JFC may avoid surprise... by thoroughly and continuously wargaming to identify probable adversary reactions to joint force actions’ (Joint Publication 5.0 2017, IV-34). As White *et al.* similarly note, as this future-oriented approach develops, ‘[p]redicting will be more important than understanding’ (White *et al.* 2017, 24). The wargaming CoP claims that the experience generated by gaming can help acclimate personnel to operating in conditions of complexity and contingency because they ‘prepare decision makers to cope with the unexpected’ (Sabin 2014, 56). To that extent, ‘games can get closer to predicting how people will act and react to circumstances far better than other techniques’ (Pournelle and Deaton eds. 2018, 76). Challenging the notion of a singular reality to be predicted using quantitative OR methods, wargaming offers the possibility of mapping of multiple possible futures which include the messy business of human decision-making.

Reflexive Decision-Making

The central means by which wargaming intervenes in the human training dimension is through the cultivation of particular kinds of decision-making practices. Indeed, a focus on decision-making is the

central distinguishing feature of wargaming, setting it apart from other kinds of models which do not have a 'human in the loop'. In Perla's words, 'a wargame is an exercise in human interaction, and the interplay of human decisions and the simulated outcomes of those decisions' (1990, 164). He expands elsewhere: wargames 'are about people making decisions and communicating them in the context of competition or conflict, usually with other people – all the while plagued by uncertainty and complexity. Through these processes, the players live a shared experience and learn from it' (in Harrigan and Kirschenbaum eds. 2016, 173). The Naval War College's War Gamers' Handbook similarly defines wargaming as 'a tool for exploring decision-making possibilities in an environment with incomplete and imperfect information' (Burns n.d., 3).

According to its advocates, wargaming works by placing players in a situation in which they are compelled to make decisions (Perla 1990, 203). By slotting participants into a scenario which calls for urgent action, they argue, wargaming provides a safe-to-fail space within which to gain decision-making experience. As Perla recently noted, games work 'not by asking people to predict how they would react, but by forcing them actually to react, even if that action is within the context of the simulacrum of reality that is the game. A wargame is, in effect, a conflict simulation run on the human brain rather than a computer' (Pournelle and Deaton eds. 2018, 76-7). The decisions taken in game are thus a proxy for establishing what steps may need to be taken in a real conflict. As the Army War College's Strategic Wargaming Series Handbook explains, 'players often discover the need to make unanticipated decisions in order for the game to progress. The rationale associated with decisions reached in the "game-world" may illuminate the need for "real-world" decisions while also informing the decision itself' (Markley ed. 2015, 2)

The aim, then, is to generate real experience in a synthetic environment; to become more proficient in making decisions under pressure and managing the consequences of those decisions. This involves an 'active and absorbing involvement in the challenge of making "life and death" decisions' (Perla 1990, 8), providing a 'dress rehearsal' for crises in which 'participants feel time and events tightening on them'. This is useful from a training perspective because in a game, 'as in a crisis, snap judgements – even hunches – drive decisions' (Allen 1989, 238). What wargaming accomplishes, then, is the development of intuition on the basis of which decisions can be made quickly and accurately. This is necessary because in the foreseeable future,

[d]ecision events will increase in frequency and speed. The "observe, orient, decide, and act" (OODA) loop decision cycle—must be compressed in the short-term to "recognize, decide, act"

(RDA). Observation and orientation as discrete actions will be a luxury that the future battlefield will not allow. Superiority will be predicated on further evolving the decision cycle to “predict, decide, and act” (PDA)—with the goal of reducing (or ultimately eliminating) the time to decide—or “predict and act” (PA)—through automation, AI, and IA. (White *et al.* 2017, 23-4).

As this suggests, the aim of wargaming is to develop specific cognitive skills. As such, it intervenes squarely in the human dimension. As one report put it, ‘[b]eyond fielding a force that simply competes in the physical domains, the Army of 2035 and beyond must be designed to dominate and achieve overmatch in the cognitive domain; for the greatest potential for superiority or supremacy lies here’ (White *et al.* 2017, 25). What is necessary to make progress in this area, it is claimed, is to understand the conscious and unconscious elements of decision-making processes rehearsed and developed through wargaming. The ultimate goal of these explorations of decision-making seems to be to use individual players in game as nodes which collectively shed light on organisational or institutional decision-making. While it is not possible to determine from the actions of a single player in a game what the decisions taken in a real-world conflict would be, it is, it seems, possible to aggregate decision-making data collected a game to gain a viable picture of real-world group decision-making. As noted above, the aim is to ‘use game results to build models that deepen our understanding of patterns in organizational decision-making’ (Pournelle and Deaton eds. 2018, 19).

The above section has established the wargaming CoP’s claims surrounding the utility of wargaming as a means to intervene in the human training dimension through developing critical thinking, explorations of plural futures, and mapping human decision-making. The following final section argues these interventions amount to an important methodological and epistemological challenge to conventional defence analysis insofar as they echo salient critical/postpositivist critiques of positivist approaches in the social sciences. It concludes that by repurposing these critical tools to impact upon players, wargaming militarises them.

Post-Quantitative Defence Analysis

Wargaming’s focus on critical thinking, plural futures, and reflexive decision-making amounts to a significant departure from conventional, quantitative OR analysis, signalling instead an inheritance from critical/postpositivist traditions. In his analysis of the IDF’s use of such traditions, Weizman relays Director of the IDF’s Operational Theory Research Institute, Shimon Naveh’s, account:

We employ critical theory primarily in order to critique the military institution itself – its fixed and heavy conceptual fundamentals.... Theory is important for us in order to articulate the gap between the existing paradigm and where we want to go.... Without theory we could not make sense of different events that happen around us and that would otherwise seem disconnected (Weizman 2006, 14).

Preferring Deleuze, Tschumi, Debord, and Bataille to Derrida, he continues, in the IDF critical ‘methods are projected in order to conceive of forms of tactical attack in an “enemy” city. Education in the humanities, often believed to be the best lasting weapon with which to combat imperialism, has been adopted as imperialism’s own weapon’ (Weizman 2006, 15). Building on these insights, in this final section I argue that US military wargaming similarly appropriates the *means* of critical/postpositivist approaches in the service of the conventional *ends* of defense analysis. By using these methods to intervene impact upon players, it concludes, wargaming contributes to the militarisation of them. It develops this account by exploring three key challenges posed by wargaming to OR: the latter’s claims to prediction, objectivity, and rationalism.

Just as critical/postpositivist approaches in the social sciences have criticised positivist approaches for inflating their predictive capacities, so too has wargaming argued that OR has never been convincing in its claim to predict the future. Davis, for example, notes that ‘even quantitative models are often loaded with subjective guestimates’ (Pournelle ed. 2017, 15). Similarly, Perla argues that

there is hidden subjectivity even in physical science. That subjectivity manifests itself in the assumptions underlying the model (usually mathematical) the scientist constructs to represent the phenomenon, as well as in the means the scientist uses to define, collect and interpret physical data. This subjectivity tends to be swept under the rug when analysts present their results by emphasizing the mathematical rigor of the calculations themselves rather than the assumptions that lay behind them (in Pournelle and Deaton eds. 2018, 75).

Paradoxically, then, it is precisely in wargaming’s rejection of the quantitative methods which frequently but erroneously claim to have predictive capacities that its novel potential for DoD analysis lies. The architects of the 3OS recognised that models which contain rather than reduce structural uncertainties are the most promising for forecasting uncertain but possible multiple futures.

As this suggests, a division or ‘schism’ (Pournelle ed. 2017, 13) exists within the DoD analysis community regarding whether or not wargaming should be considered a subset of modelling. This debate cuts to the heart of the epistemological and methodological raised by the recent renaissance in wargaming. The conventional account is that the quantitative approaches associated with modelling and simulation are objective, while wargaming’s qualitative status limits it to subjective claims (Lawson III

2016, 8). By bringing wargaming closer to the quantitative-objective side of the epistemological continuum, it has been suggested, wargaming can be improved: 'the integration of S&T [science and technology] skillsets to facilitate data exploitation (e.g., operations research, science and engineering)... will not only increase the quality of wargames and their products, but will facilitate data-driven exploration of military utility for new and integrated S&T concepts' (Bestard 2016, 13). A large proportion of wargaming CoP is, however, less convinced about such an integration, and argue in ways that perhaps surprisingly chime with post-positivist critiques of positivist social science in the civilian academy, that quantitative methods do not yield objective results.

Speaking and the 2016 MORS Special Meeting on Wargaming, Davis claimed that Work's call to reinvigorate wargaming was 'the result of senior officials not being satisfied with what was coming from the "analysis community" or, more specifically, the "modelling community"'. Work's memo, he continued, 'was directed specifically toward the goal of innovation' and was driven by 'dissatisfaction with what was being delivered' (in Pournelle ed. 2017, 13). The dissatisfaction in question was directed at the limitations of the results produced by quantitative analysis, which had dominated the DoD since the mid-20th century. Just as in the social sciences, in the 1950s the defense analysis community underwent a methodological shift towards quantitative methods which prized mathematical, statistical, and 'scientific' approaches. The result of this was the rise of Operations Research (OR), associated with Robert McNamara's period in office as Secretary of Defense, a method which claimed to be a science rather than an art (Allen 1989, 124). As Davis explains, 'in this period defense modelling and systems analysis 'emphasized being scientific, rigorous, quantitative, and tied to mathematics. This was to be an antidote for hand-waving subjective assertions. That desire translated into an emphasis on "closed" models with no human interactions, which allowed reproducibility.' Accompanying this shift, he continues, came a devaluation of methods perceived as less scientific and objective. Quantitative analysts became 'disdainful of such other forms of modeling as the history-based formula models of Trevor Dupuy and the commercial board games of Jim Dunnigan and Mark Herman. These alternative approaches seen as somehow "lesser," because they were allegedly less rigorous and scientific (in Pournelle ed. 2017, 14). 'Attacks' of this kind have persisted to the present day (Perla in Pournelle and Deaton eds. 2018, 78).

This approach advocated a rationalist framework in which 'the most rational possible decisions' would be programmed into computers, 'which would quickly calculate the outcomes of many such decisions' (Perla 1990, 109). Humans, with their unruly and unpredictable tendencies, were to be kept

‘out of the loop’ so as to ensure these maximally rational inputs and outputs. This led to a situation in which there was more maths than common sense (Harrigan and Kirschenbaum 2016, xxxiv). As Hanley explains, in the late 1960s and early 1970s ‘military modelers concentrated on modeling combat and logistical processes as though they were physics problems. As computer speeds increased exponentially with Moore’s Law, these models were aggregated into ever more complicated campaign simulations, losing sight of the Operation Research Group’s cautions and methods for estimating confidence factors’ (in Pournelle and Deaton 2018, 65). Models, thus, took humans entirely out of the equation, rejecting a focus on actual decision-making processes in favour of ideal ones.

As this suggests, this approach is limited in a series of significant ways, and has been challenged by the wargaming CoP in ways which mirror post-positivist challenges to positivist orthodoxies. The wargaming CoP argues that the results produced by various models created by different analysts lead to a wide range of conclusions, which themselves were not verifiable or refutable (Allen 1989, 245). Quantitative methods, the wargaming CoP argues, are not effective in conditions of uncertainty; some aspects of conflict are not amenable to rationalisation because, as Peterson puts it, ‘they reflect the unfathomable depths of interpersonal relationships’ (in Harrigan and Kirschenbaum 2016, 15). Thus, as Nakaruma puts it, despite the hubris of quantitative social science, its fruits prove limited and the gap between simulation and ‘truth’ persists (in Harrigan and Kirschenbaum eds. 2016, 43).

The wargaming renaissance has thus precipitated a profound challenge to the prevailing methods used in DoD analysis. As one report states, ‘DoD modeling has been too dominated by a narrow approach. The analytic community should take this seriously and reform, as suggested here. This will include incorporating human gaming in the larger activity of modeling, simulation, and analysis, and also using modeling to inform the design and execution of human gaming’ (David in Pournelle ed. 2017, 16). In an era of complexity, models which rely on mathematics and try to make predictions are limited by their inability to cope with uncertainties in inputs and the effects of such uncertainties on outputs (Perla 1990, 238). As Perla more recently explained, wargaming does not advocate

the reductionist disassembling of problems into their component and quantitative parts. Instead, it is about the holistic integration of problems and the human beings to who to confront and act to overcome them... Here is where most of the classic forms of modelling and simulation fall down. They cannot forecast outcomes that are already embedded in the underlying mathematical constructs of the model or simulation... They do not, in fact, generate new knowledge... Wargaming is a far better tool for going beyond old knowledge and exploring unforeseen consequences and... illuminate dark corners of future possibilities (in Harrigan and Kirschenbaum eds. 2016, 178).

What is required, then, according to the wargaming CoP, is a fresh approach which explores, rather than avoids or ignores, the complexity, uncertainty, and unpredictability of the contemporary security environment.

The key area of study in the new security environment is, they claim, that of human decision-making. It is not the results of games framed quantitatively in terms of wins/losses/hits and so forth which matter but rather the mapping of decisions taken, and paths not taken. The player, then, is the *object* of the game, standing in for whoever might be taking equivalent decisions in a 'real-world' conflict. Importantly, wargaming works as a process of teaching player how to make decisions, and in some cases, what decisions to take: 'Wargaming across different time horizons will also serve a crucial educational function by bringing together teams of defense professionals to think critically about potential future challenges' (Work 2015b, 2).

As this suggests, wargaming has incorporated a series of reflexive methods usually associated by critical/postpositivist traditions into the military's analytic toolkit. To return to a noteworthy example, TRADOC's 'Applied Critical Thinking Handbook' contains such chapter headings as 'Self-Awareness'; 'Fostering Cultural Empathy'; and 'Critical Thinking', and such sub-headings as 'Interpersonal Communication'; 'Cultural Awareness'; 'Ethnocentrism'; 'Groupthink Mitigation'; 'Ways of Seeing'; 'Empathetic Questions'; 'Cognitive Biases'; and 'Telling Stories'. This mirrors Weizman's account of IDF learning materials which contain such headlines as 'Difference and Repetition – The Dialectics of Structuring and Structure'; 'Formless Rival Entities'; 'Fractal Maneuver'; 'Velocity vs. Rhythms'; 'The Wahhabi War Machine'; 'Post-modern Anarchists'; 'Nomadic Terrorists' – phrases which mainly reference the work of Deleuze and Guattari (Weizman 2006, 11).

The Handbook's purpose, its authors explain, is to 'challenge[s] students to examine things they hold sacrosanct. We expose them to the ethnocentrism of their own thinking, their overreliance on method, their tendency to default to Western/Aristotelian logic, their lack of appreciation for the frames that subconsciously capture their thinking' (TRADOC 2015, 5). This again reflects Weizman's account; one IDF educator he interviewed noted that '[s]everal of the concepts in *A Thousand Plateaus* became instrumental for us ... allowing us to explain contemporary situations in a way that we could not have otherwise explained. It problematized our own paradigms'... for example the distinction they have pointed out between the concepts of 'smooth' and 'striated' space ... [that accordingly reflect] the organizational concepts of the 'war machine' and the 'state apparatus' (Weizman 2006, 11). Such

themes and intentions would seem more at home in a critical theory and methods module guide than a military training manual.

Explicitly drawing upon the thought of figures including Carl Jung, Clifford Geertz, Claude Levi-Strauss, and Bertrand Russel, the Handbook is intended to impact upon the human dimension: '[P]eople and organizations court failure in predictable ways, that they do so by degrees, almost imperceptibly, and that they do so according to their mindsets, biases, and experience, which are formed in large part by their own culture and context. The sources of these failures are simple, observable, and lamentably, often repeated' (TRADOC 2015, 1). What is necessary to rectify this problem, it continues, is to cultivate new decision-making processes:

We believe that good decision processes are essential to good outcomes. To that end, our curriculum is rich in divergent processes, red teaming tools, and liberating structures, all aimed at decision support. We educate people to develop a disposition of curiosity, and help them become aware of biases and behavior that prevent them from real positive change in the ways they seek solutions and engage others. We borrow techniques, methods, frameworks, concepts, and best practices from several sources and disciplines to create an education, and practical applications, that we find to be the best safeguard against individual and organizational tendencies toward biases, errors in cognition, and groupthink (TRADOC 2015, 1).

Clearly indicated here is the mobilisation of critical/postpositivist methods in the service of military ends. In concert with critical/postpositivist approaches, wargaming is framed as cultivating a reflexive subject who problematises inherited assumptions and seeks to mitigate implicit bias. Contrary to critical/postpositivist traditions, however, these skills are to be deployed in the service of conventional security/military purposes. Indeed, such reflexivity is useless, the Handbook explains, unless tied to specific goals: red-teaming aims at 'improving cultural understanding with the goal of enhancing the chances of successful outcomes in military planning... It is only meaningful when regarded as part of a larger body of thought (e.g., strategy, design, campaign planning). Cultural analysis is part of the larger intellectual process of war fighting and peace keeping' (TRADOC 2015, 38). Such a sentiment is echoed in Weizman's account: the IDF uses 'particular strands of left-wing theories... in order to project power, not to subvert it' (Weizman 2006, 15). As Naveh told him:

We must differentiate between the charm and even some values within Marxist ideology and what can be taken from it for military use. The theories do not only strive at a utopian socio-political ideal that we may like or dislike, but are based upon a methodology that wants to disrupt and subvert the existing political, social, cultural or military order. The disruptive capacity in theory [elsewhere he mentions the term 'nihilist'] is the aspect of theory that we like and use.... This theory is not married to its socialist ideals (Weizman 2006, 15).

This clearly demonstrates the extent to which such traditions are appropriable by state/military institutions. As the above has shown, the integration of these methods reflects the limitations of quantitative approaches in the complex and uncertain security environment. As Christiansson suggests, this implies that the breakdown of rationalist methods is a necessary condition of getting ahead in reflexive modernity (2018, 274-5). The cost of this development is that the critical tools of postpositivist approaches are turned against their creators as hegemonic actors harness their analytical purchase for their own ends. We might view this 'post-quantitative' approach as a step towards the militarisation of the methods developed and used in critical/postpositivist social science.

Conclusion

This paper has argued that key elements of critical/postpositivist theory are at work in US military wargaming, and that this has resulted in both a profound challenge to prevailing methodological and epistemological approaches to defense analysis in the US and, by using them to impact upon players, the militarisation of these approaches. It began by locating the origins of this renaissance in the Defense Innovation Initiative and Third Off-Set Strategy. It demonstrated that the appeal of wargaming for the military lies in its capacity to transcend several of the limitations of OR defense analysis; because it insists on having a human in the loop, wargaming allows a focus on critical thinking, multiple futures, and reflexive decision-making which quantitative approaches cannot. Mirroring critical/postpositivist critiques of positivism across the social sciences – in particular its claims to prediction, objectivity, and rationalism – the paper argued that wargaming demonstrates the limitations of quantitative defence analysis. By decoupling critical/postpositivist means from their intended ends, and using them instead to impact upon players, wargaming demonstrates the appropriability of these methods for conventional security purposes.

Focusing on the unruly 'human dimension', the paper argued it that the players of military wargames themselves who are the target of the gaming process. In cultivating specific critical thinking and reflexive decision-making processes in the service of military ends, wargaming intervenes in the interior of the trainee. Against the counter- or anti-hegemonic purposes of critical/postpositivist theory, wargaming deploys these tools to influence the ways players think, process information, and make decisions. Intervening in the player's inner realm thereby becomes an objective coded into the

wargame. As noted in the Introduction, this amounts to an invasion of the “home” – of intimate space, the space of subjectivity – [which] has become yet another “last frontier” (2006, 20).

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